[Fig. 1]

a Maximum imaging speed

b Maximum resolution

c Maximum brightness

[Fig. 2]

a Start system program

b Specimen dimension

c User input

d Optimum irradiation intensity at focus

e Fluorochrome properties

f User input

g Maximum linear magnification and minimum working distance of objective

h Objective selection

i User input

j Numerical aperture of objective and

k Optimum laser output

l Determined largely by specimen

m Desired axial resolution

n User input

o No. of planes, pinhole setting ->
Lateral resolution, quantum effects ->
No. of pixels per plane

p Preferences largely selected by user

q Bleaching characteristics of specimen

r Maximum S/N

s Selected S/N

t User input

u Imaging time
PMT voltage setting

INTERNATIONAL PRELIMINARY EXAMINATION REPORT - ADDENDUM

International Application No. PCT/DE99/03527

1 regarding Item V:

1.1 The application is directed toward a method for software-assisted, interactively controlled setting of the system parameters of a confocal laser scanning microscope. A method of this kind is known, for example, from D6. In this, specimen and system parameters as well as "problems" are input, whereupon the system determines parameter settings that are set automatically or by the user (see in particular page 5, fourth paragraph; page 6, third paragraph; and page 14, line 14 through page 15, line 8).

The subject matter of Claim 1 is therefore not novel.

The subject matter of Claim 1 is also not novel with respect to D1, D3, D4, or D5.

1.2 The dependent claims contain no features that, in combination with the features of any claim to which they refer, meet PCT requirements with regard to novelty or inventive step, since they merely define the various parameters that are set when the microscope is used.

2 regarding Item VIII:

2.1 The rewording of the new claims, achieved by combining several earlier claims, results in some cases in inconsistencies. For example, it is not clear what the "subsequent parameters" recited in Claim 2 are meant to be. In other words: in Claim 2, what is the subject and what is the object? In Claim 5, the articles appear to have been lost.

2.2 On new page 3, the first four lines of the earlier Specification page 3 are missing.

[amended page 3 of Specification]

system parameters of a preferably confocal laser scanning microscope, setting of the system parameters being accomplished by way of a control computer. This method is intended to make possible reliable and also reproducible setting of the laser scanning microscope, specifically in consideration of predefinable system and specimen parameters.

The method according to the present invention achieves the aforesaid object by way of the features of Claim 1. ~~According to the latter, the method for setting the system parameters of a preferably confocal laser scanning microscope is characterized by an interactive user interface, such that upon input of at least one specimen parameter and/or at least one optionally selectable system parameter, settings for the remaining system parameters are proposed to the user and/or the remaining system parameters are set automatically~~.

What has been recognized according to the present invention is that a reduction in the time necessary for optimum setting is possible, in reasonable and reproducible fashion, only if an interactive user interface based on the physical correlations and the formulas hereinafter is accomplished. In other words, the control computer has available a corresponding software program which interactively generates a user interface. Upon input of at least one specimen parameter and/or optionally of a selectable system parameter, settings for the remaining system parameters are proposed to the user. Following selection, or (also selectably) automatically, the remaining system parameters are set on the basis of the software's proposal. What is essential is that a quasi-optimal setting of the system parameters is always interactively proposed. Depending on the selection of an individual system parameter or several system parameters, the remaining system parameters are adapted to the selection that is made, and additional optimization is performed in the context of the definition or definitions. The same applies to the specimen parameters.

[new Claims]

1. A method for setting the system parameters of a confocal laser scanning microscope, setting of the system parameters being accomplished by way of a control computer, characterized by the following steps:
   - creation of a user interface interactively with the user;
   - input of at least one specimen parameter, at least one selectable system parameter by the user, at least one definable problem regarding image acquisition **[sic]**;
   - proposal of other system parameters, optimization paths, and imaging strategies regarding image acquisition;
   - selection of a proposal by the user; and
   - automatic setting of the system parameters of a selected system setting or imaging strategy.

2. The method as defined in Claim 1, wherein the input of at least one of the following parameters determines the specimen dimension to be imaged, the specimen region to be imaged, the number of optical steps, the specimen property to be imaged, and the detection method. **[sic - see IPER Appendix 2.1: any of the above parameters could also be the subject]**.

3. The method as defined in Claim 2, wherein the detection method involves alternatively the use of a fluorescence method and a reflection method.

4. The method as defined in Claim 1, wherein the proposal step concerns the use of a suitable objective having the highest possible numerical aperture; the maximum resolution achievable with the selected objective, and the present resolution on the basis of specific and previously set system parameters, are reported to the user; and the number of pixels per image plane is proposed to the user.

5. The method as defined in Claim 1, wherein the specimen property to be determined serves to ascertain the optimum irradiation intensity; **[and the]** optimum irradiation intensity is proposed to the user.

6. The method as defined in Claim 1, wherein for setting a detection pinhole diameter, an optimized value at which the image acquisition resolution is maximal, while the image acquisition signal-to-noise ratio is still usable, is proposed to the user.

7. The method as defined in Claim 1, wherein the creation of the user interface **[?is such that]** upon selection of at least one system parameter all those system parameters that are influenced by the selection are presented for the user, and the user is also informed as to how, on the basis of the selection of a system parameter, an image acquisition can be performed with the best possible quality.

8. The method as defined in Claim 1, wherein at least one criterion that is important for the application can be defined for the optimization thereof; and that based on this definition, the further system parameters are interactively proposed and/or automatically set.

9. The method as defined in Claim 8, wherein the predefined criterion is the signal-to-noise ratio that is to be achieved.

10. The method as defined in Claim 1, wherein assistance or solutions for predefined problem situations are offered by means of the user interface.

11. The method as defined in Claim 10, wherein the problem situations are the following problems:
- "the specimen (in the case of fluorescence specimens) bleaches excessively"; and/or
- "the image data are noisy"; and/or
- "the measurement time is too long"; and/or

- "the resolution is too low."

12. The method as defined in Claim 1, wherein the at least partially mutually dependent system parameters are determined by means of an algorithm.

13. The method as defined in Claim 1, wherein the system parameters are retrieved, in consideration of the definitions, from an expert system stored in a database.

14. The method as defined in Claim 1, wherein the system parameters are ascertained, in consideration of the definitions, using fuzzy logic, and are set after selection or automatically.

15. The method as defined in Claim 1, wherein the creation of a user interface for the user comprises an activatable and interfacing teaching program for optimal - preferably specimen-specific and/or problem-specific - system setting and/or imaging strategy.